TAVR with a Self-Expandable Prosthesis in a Patient with Porcelain Aorta: the Chaperone Technique

Alfonso IELASI, MD FESC

Andrea BUONO MD, Mariano PELLICANO MD, Franceso CASILLI MD, Marta BANDE MD, Massimo MEDDA MD, Maurizio TESPILI MD

Istituto Clinico Sant'Ambrogio, Milan, Italy

Clinical History

73 year-old male, hypertensive, hypercholesterolemic, former smoker.

Peripheral artery disease.

Prior PCI and DES implantation on LAD and LCx .

Prostate cancer treated (2019) by chemo- and radiotherapy (on follow-up)

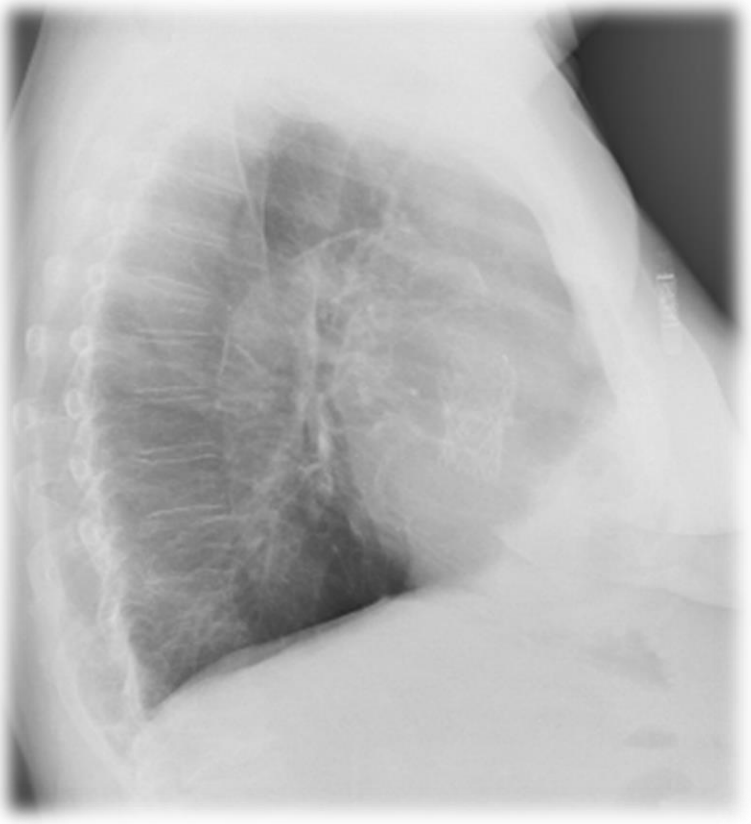
Effort dispnoea (NYHA II)→ TT echocardiogram revealed: **severe aortic valve stenosis** (AVA 0.7 cm^2, maximun trans-valvular gradient 78 mmHg, mean trans-valvular gradient 45 mmHg). Normal left ventricle ejection fraction (EF 60%).

STS score mortality 1.4%
Euroscore II 1.61%

→ Aortic valve replacement was indicated

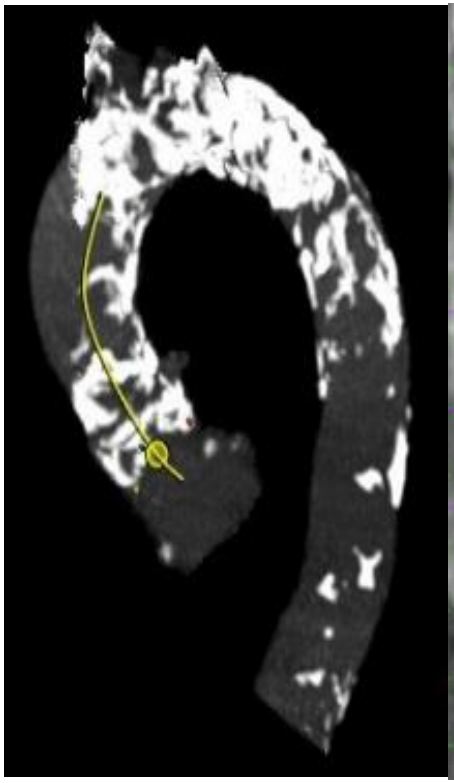
Chest X-Ray

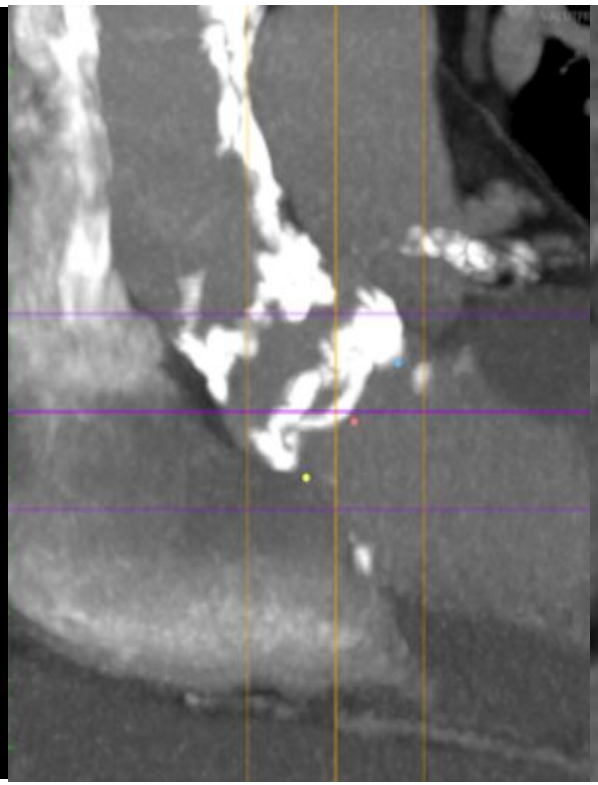
At chest x-ray: severe aortic arch calcifications were reported.

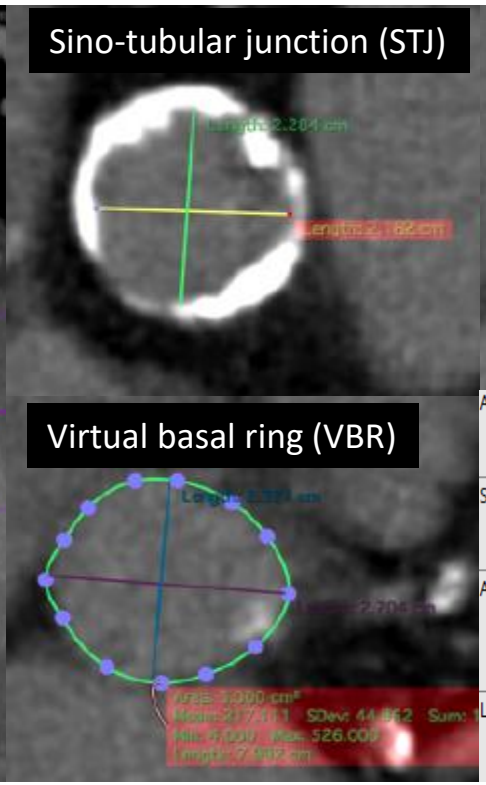


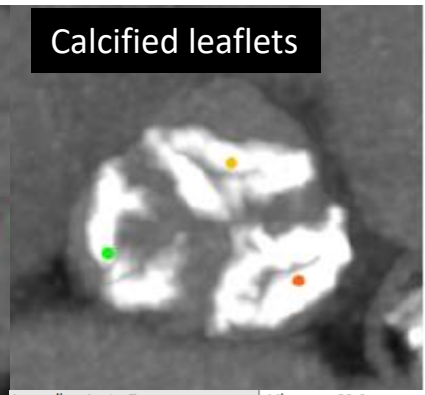
CT Scan

Angio-CT scan confirmed severe calcifications located at the aortic arch and ascending aorta (including the sino-tubular junction –STJ-)





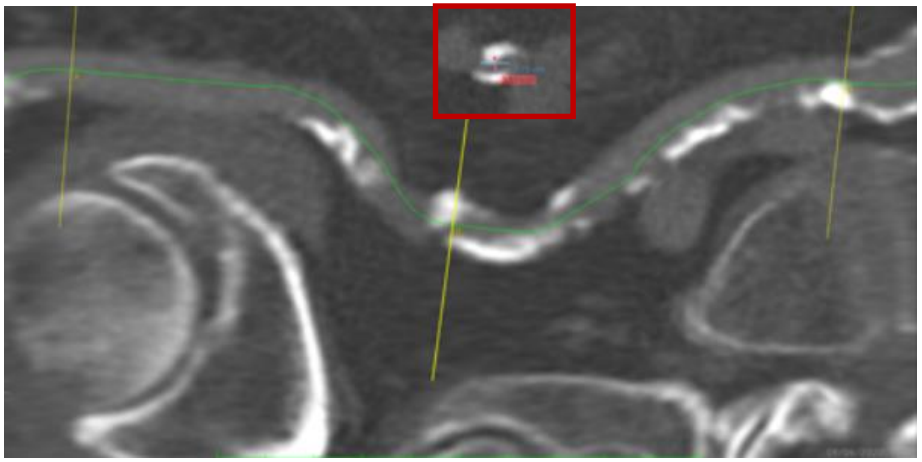




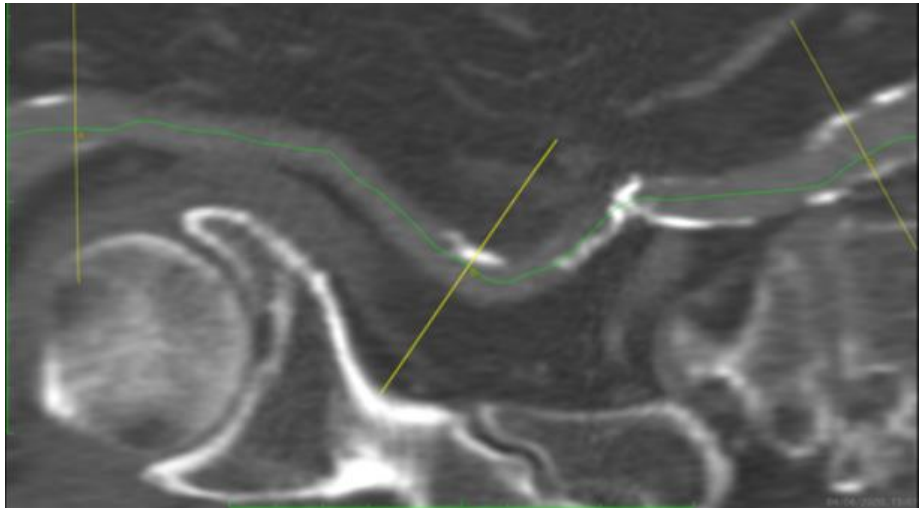
Ascending Aorta Ø	Min:	30.6 mm
	Max:	33.5 mm
	Average:	32.1 mm
Sinotubular Junction Ø	Min:	24.3 mm
	Max:	25.9 mm
	Average:	25.1 mm
Aortic Annulus	Min Ø:	22.4 mm
	Max Ø:	27.6 mm
	Average Ø:	25.0 mm
	Eccentricity:	0.19
LVOT Ø	Min:	21.4 mm
	Max:	26.9 mm
	Average:	24.1 mm

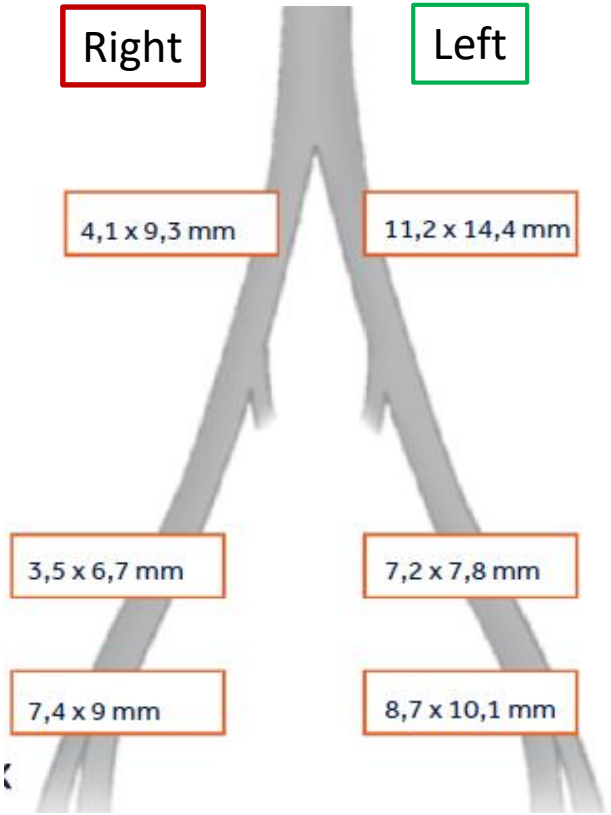
Peripheral CT Scan

Right
Ilio-femoral axis



Left
Ilio-femoral axis





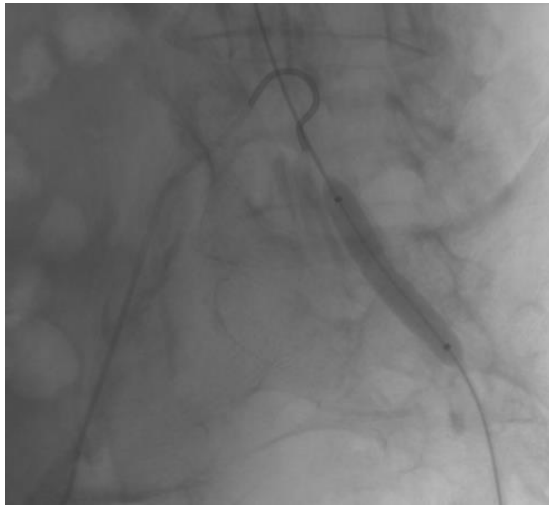
Decision

1. TAVI despite the "young" age (Porcelain aorta).
2. A self-expandable (SE) THV (Evolut R 29 mm) was chosen due to the heavily calcification at the STJ (similar diameter than the VBR) → right ilio-femoral axis was not suitable to THV delivery transit.
3. Left external iliac artery pre-dilatation (IVL) was planned to favour the THV delivery system crossing through the femoral route.
4. Cerebral anti-embolic protection placement.

Basal Aortography

TF TAVI Procedure (1)

After pre-dilatation (balloon 7.0x40 mm, IVL 7.0 30 pulses and again balloon 7.0x40 mm) at the left external iliac artery (LEIA), a sheatless attempt through the left common femoral access was performed but the the THV delivery system did not cross the mid LEIA.



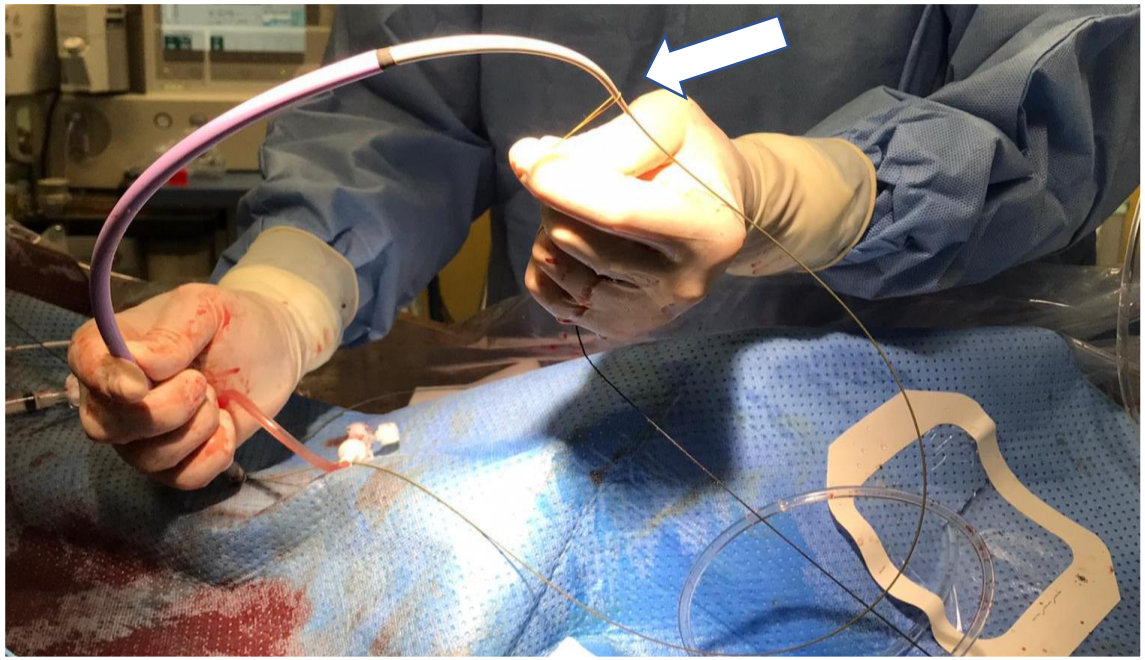
A 18-F sheat was then placed and advanced at the level of the mid LEIA favouring THV delivery system crossing.

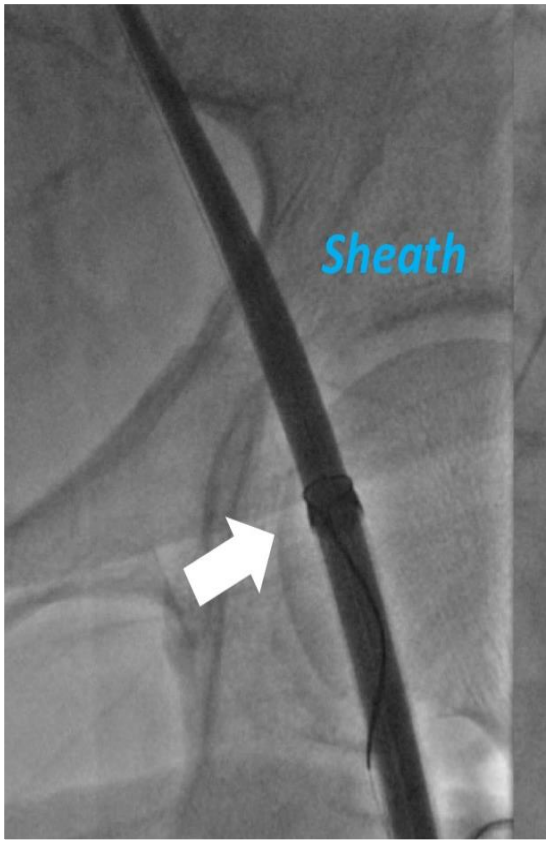
TF TAVI Procedure (2)

Once at the aortic arch the THV did not cross because of the heavily calcifications even after placing a stiff wire (Lunderqvist) within the pigtail and after inflating a 18 mm balloon apart (*sliding-balloon technique*).

Bail-out Snare Positioning

After THV and sheath removal, we decided to externally pre-mount on the tip of the 18-Fr sheath a 20-mm AndraSnare catheter in order to leave the Safari wire in the LV.

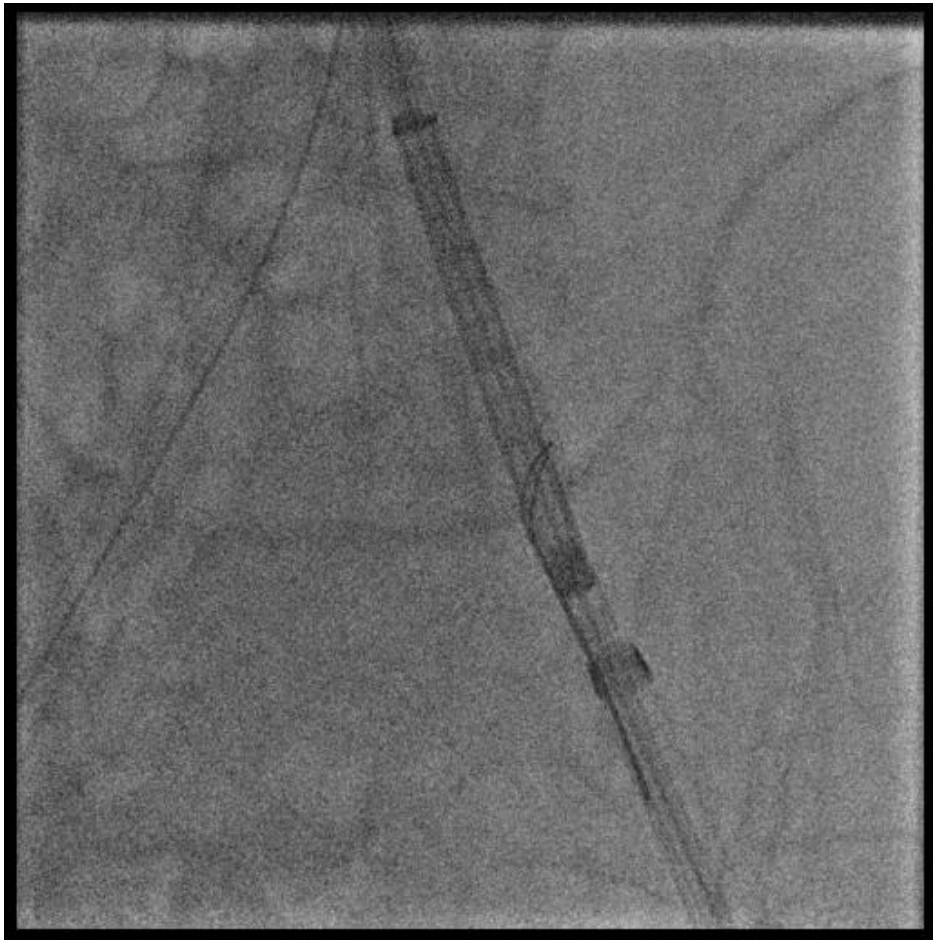




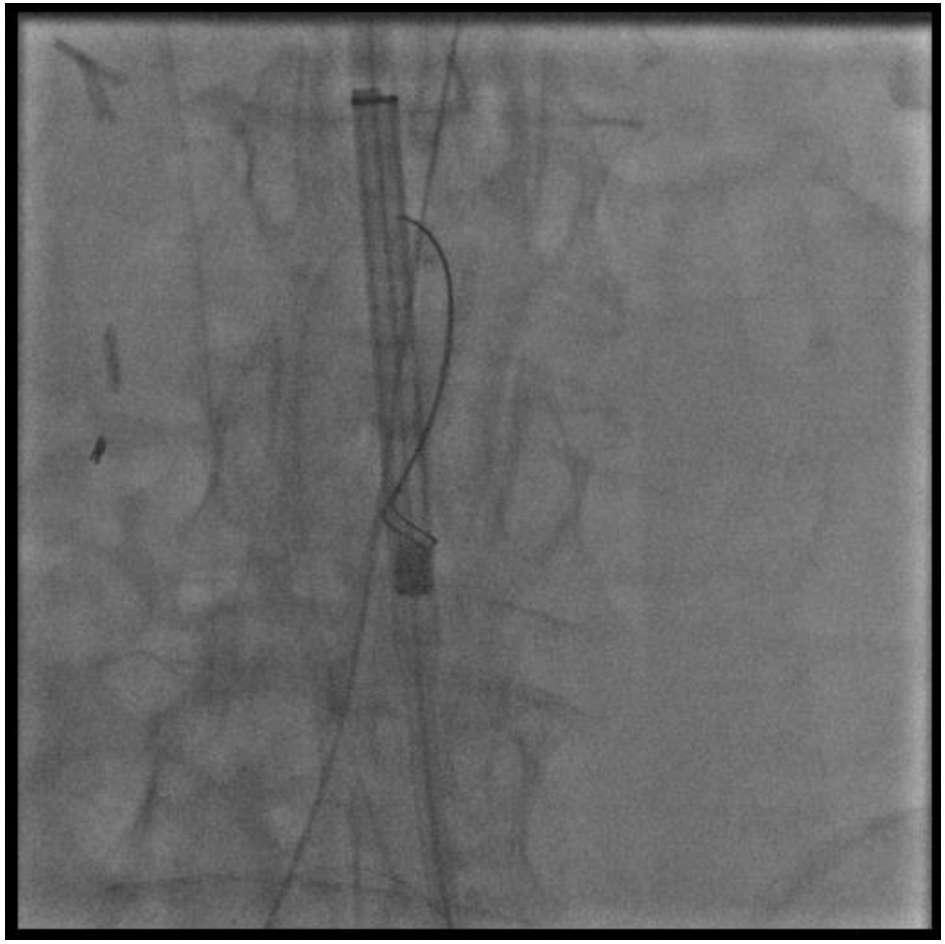
Both (the sheath and the snare), were advanced (snare external to the sheat) through the left CFA toward the abdominal aorta.

THV Advancement

THV delivery system was then introduced through the 18-Fr sheath and the snare system was positioned and tied at nose-cone level.



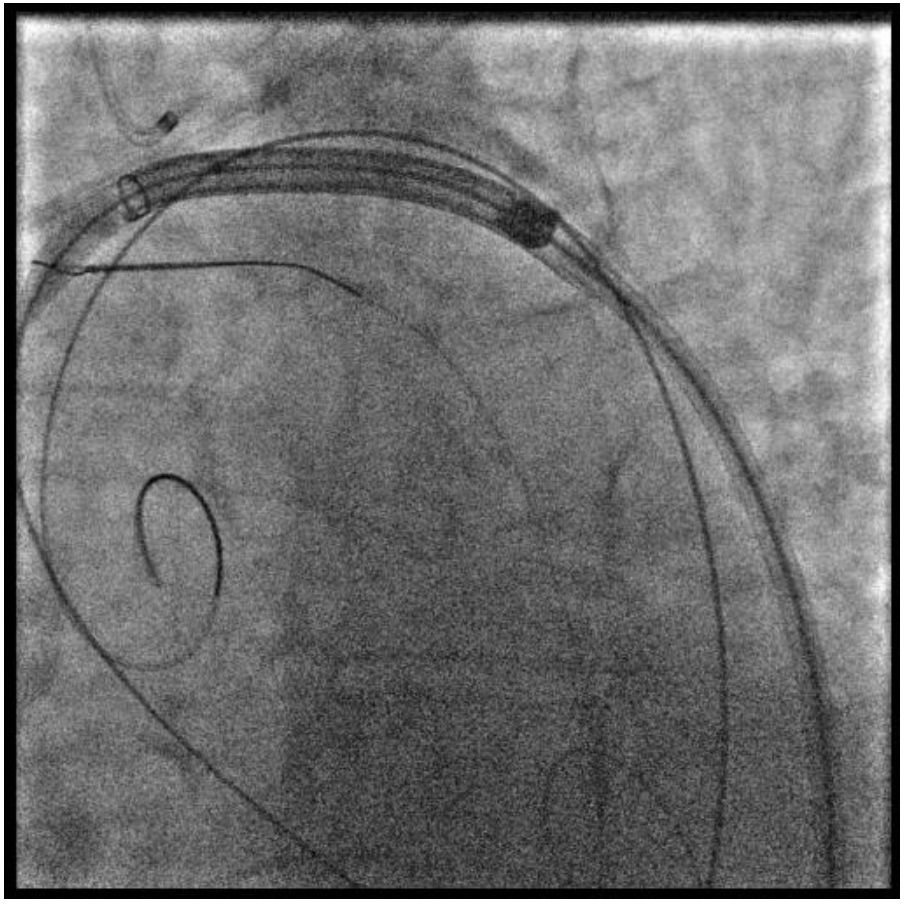
THV and snare advancement through a heavily calcified EIA

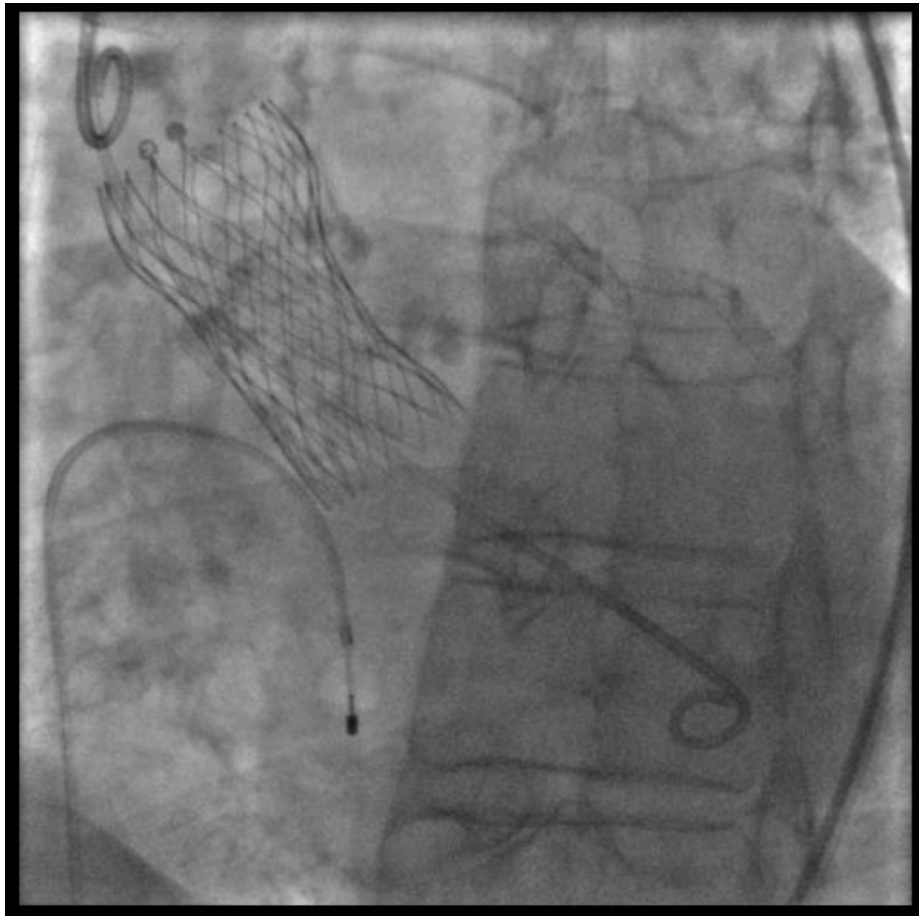


Snare aligment at the nosecone

Snaring the THV Delivery System

Once the THV was at the aortic arch level, a progressive traction of the AndraSnare increased THV delivery system trackability inside the aortic arch, allowing to advance the entire system in the aortic root ("Chaperone" technique, *Medda M et al JACC Interv 2018*).

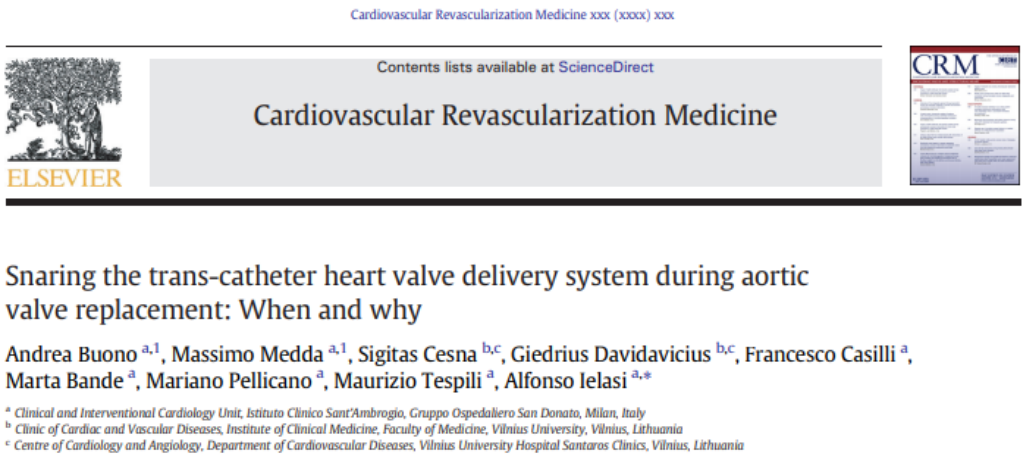




Conclusions

None of the commercially available SE THVs used for TAVR has a deflectable delivery system.

The use of a snare catheter may help to re-direct the delivery system during its navigation, particularly through the aorta, allowing successful THV implantation in special scenarios (such as heavily calcified aortic arch, gotic aortic arch, and the presence of a previously implantaed THV at the level of the ascending aorta) either in bail-out situations.



Cardiovascular Revascularization Medicine xxx (xxxx) xxx

Contents lists available at ScienceDirect

Cardiovascular Revascularization Medicine

ELSEVIER

Snaring the trans-catheter heart valve delivery system during aortic valve replacement: When and why

Andrea Buono [a,1], Massimo Medda [a,1], Sigitas Cesna [b,c], Giedrius Davidavicius [b,c], Francesco Casilli [a], Marta Bande [a], Mariano Pellicano [a], Maurizio Tespili [a], Alfonso Ielasi [a,*]

[a] Clinical and Interventional Cardiology Unit, Istituto Clinico Sant'Ambrogio, Gruppo Ospedaliero San Donato, Milan, Italy
[b] Clinic of Cardiac and Vascular Diseases, Institute of Clinical Medicine, Faculty of Medicine, Vilnius University, Vilnius, Lithuania
[c] Centre of Cardiology and Angiology, Department of Cardiovascular Diseases, Vilnius University Hospital Santaros Clinics, Vilnius, Lithuania